

REMARKS

Claims 1-5, 7-11 and 29-38 are pending in the present application. Claims 1-5, 7, 8 and 29-38 have been rejected. Claims 6 and 12-28 were previously canceled. No new matter has been added.

Claims 1-5 and 7 are rejected under 35 U.S.C. 102(e) as assertedly being anticipated by U.S. Patent Application No. 2004/0126925 to Rodgers et al. (hereinafter “Rodgers”). Claims 1-5, 29-33, and 35-38 are rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over U.S. Patent Application No. 2004/0248339 to Lung (hereinafter “Lung”). Claims 7 and 34 are rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Lung in view of “An Edge Contact Type Cell for Phase Change RAM Featuring Very Low Power Consumption” by Ha et al (hereinafter “Ha”). Claim 8 is rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Lung and Ha and further in view of U.S. Patent No. 6,806,528 to Lee et al (hereinafter “Lee”) and also under 35 U.S.C. § 103(a) as being unpatentable over Rodgers in view of Lee.

As an initial matter, Applicants would like to thank the Examiner for the indicated allowance of Claims 9-11.

The Office Action asserted that Claims 1-5 and 7 are anticipated under 35 U.S.C. § 102(e) in view of Rodgers. Office Action, p. 2. However, Applicants note that, in the discussion following that statement, the Office Action also cites and references elements from claims 29, 33, and 35. Office Action, p. 3. Accordingly, Applicants have attempted in the following paragraphs to illustrate to the Examiner the patentable differences between Applicants’ claims 1-5, 7, 29, 33, and 35 and the presented prior art references

for the claims that were referenced by the Office Action. If this is in error, and only Claims 1-5 and 7 are rejected under 35 U.S.C. § 102(e), Applicants respectfully request clarification in a subsequent communication.

35 U.S.C. § 102 Rejections

Applicants' Claim 1 recites "a layer of a phase change material having...a substantially uniform thickness" and "an electrode...in contact with the phase change material layer." The Office Action asserted that "the phase change material portion 37 formed above the trench area in which it contacts the electrode 38 is not relied on for teaching as 'a layer of a phase change material' as claimed, but rather, the phase change material portion 37 formed within the trench where it connects with the conductive film 34 is relied on for teaching as 'a layer of a phase change material' as claimed". Office Action, p. 10. However, if only that portion of the phase change material (Rodgers Ref. No. 37) that is located within the trench is considered to be the "layer of phase change material" in Applicants' Claim 1, then the electrode (Rodgers Ref. No. 38) will no longer be "in contact with the phase change material layer" as required by Applicants' Claim 1. Rather, using the interpretation asserted by the Office Action, there would be a second layer of phase change material located between the electrode and a first layer of phase change material, and preventing the electrode from being "in contact with the phase change material layer" as required by Applicants' Claim 1. Because of this, Rodgers cannot anticipate Applicants' Claim 1 because "each and every element," as required by MPEP § 2131, is not disclosed by Rodgers. Accordingly, Applicants respectfully request that this rejection of Applicants' Claim 1 be withdrawn.

Claims 2-5 and 7-8 depend from and further limit independent Claim 1 in a patentable sense. Accordingly, Applicants respectfully request that the 35 U.S.C. § 102(e) rejections of claims 2-5 and 7-8 be withdrawn as well.

Applicants' Claim 29 recites "an electrode electrically coupled with the phase change material layer" and "the electrode extending away from a substantially planar top surface of the phase change material layer." The Office Action, as discussed above, has asserted "the phase change material portion 37 formed above the trench area in which it contacts the electrode 38 is not relied on for teaching as 'a layer of phase change material' as claimed, but rather, the phase change material portion 37 formed within the trench where it connects with the conductive film 34 is relied on for teaching as 'a layer of phase change material' as claimed." Office Action, p. 10. However, if the "layer of phase change material" in Rodgers is limited to only that material that is located within the trench, then the electrode in Applicants' Claim 29 would not be "extending away from a substantially planar top surface of the phase change material layer" as required by Applicants' Claim 29. Under the interpretation proposed by the Office Action, the electrode would extend away from a second phase change material layer located between the electrode and the "layer of phase change material" recited in Applicants' Claim 29 and not a "top surface of the phase change material layer" as required by Applicants' Claim 29. Accordingly, because Rodgers does not disclose "each and every element" as required by MPEP § 2131, Rodgers cannot anticipate Applicants' Claim 29, and Applicants respectfully request that the rejection of this claim be withdrawn.

Claims 30-35 depend from and further limit independent Claim 29 in a patentable sense. Accordingly, Applicants respectfully request that the 35 U.S.C. § 102(e) rejections of claims 30-35 be withdrawn as well.

35 U.S.C. § 103 Rejections

Applicants' Claim 1 recites "the layer of phase change material has a substantially planar top surface." The Office Action asserted that Lung discloses a "substantially planar top surface" by displaying a U-shaped phase change material layer (Lung Ref. No. 900) and pointing to two surfaces that are at different elevations from each other. Office Action p. 5. Applicants respectfully note that the "top surface" of the phase change material in Lung is not "substantially planar" because at least two of the surfaces are not in alignment with each other.

The Office Action appears to be proposing that, as long as a first portion of the phase change material is substantially planar, then the entire "top surface" of the phase change material is "substantially planar," even if a second portion of the phase change material is not "substantially planar" with the first portion. Applicants respectfully assert that this proposition may well lead to unrealistic situations such as the one shown in the following figure:



Following the reasoning of the Office Action (as understood by Applicants), as long as two portions are "substantially planar" to each other (as the two points on the line are "substantially planar" to each other) then the overall curve would be "substantially planar" as well, without regard to other points which may not be planar with the original two points. Because the curve in the figure is obviously not "substantially planar," the Office Action's interpretation of "substantially planar" cannot be the appropriate one.

Rather, the top surface of the electrode must be “substantially planar” along its entire length, and Lung, with its admittedly multi-level top surface, simply does not disclose this limitation. Consequently, Lung does not “teach or suggest all the claim limitations” as required by MPEP § 2143 for a prima facie case of obviousness, and Applicants’ Claim 1 cannot be obvious over Lung. Accordingly, Applicants respectfully request that this rejection of Applicants’ Claim 1 be withdrawn.

Claims 2-5 and 7-8 depend from and further limit independent Claim 1 in a patentable sense. Accordingly, Applicants respectfully request that the 35 U.S.C. § 103(a) rejections of claims 2-5 and 7-8 be withdrawn as well.

Applicants’ Claim 29 recites “the electrode extending away from a substantially planar top surface of the phase change material layer.” As discussed above with reference to Applicants’ Claim 1, Lung simply does not disclose “a substantially planar top surface of the phase change material layer.” Rather, the interpretation proposed by the Office Action that portions of the top surface that are planar to each other but not to other portions of the top surface make the top surface “substantially planar” would lead to unrealistic interpretations of what may be considered “substantially planar.” Accordingly, because Lung does not disclose “a substantially planar top surface of the phase change material layer,” “all the claim limitations” are not taught or suggested by Lung as required by MPEP § 2143, and Applicants’ Claim 29 is not obvious over Lung. Therefore, Applicants’ respectfully request that this rejection of Applicants’ Claim 29 be withdrawn.

Claims 30-35 depend from and further limit independent Claim 29 in a patentable sense. Accordingly, Applicants respectfully request that the 35 U.S.C. § 103(a) rejections of claims 30-35 be withdrawn as well.

Applicants' Claim 36 recites "a layer of phase change material with a substantially planar top surface." As discussed above with respect to Applicants' Claim 1, Lung simply does not disclose "a layer of phase change material with a substantially planar top surface." Rather, Lung discusses a U-shaped "layer of phase change material" whose top surface has multiple portions at different elevations from each other. Accordingly, Lung does not disclose "all the claim limitations" as required by MPEP § 2143, Applicants' Claim 36 is not obvious over Lung, and Applicants' respectfully request that this rejection of Applicants' Claim 36 be withdrawn.

Claims 37-38 depend from and further limit independent Claim 36 in a patentable sense. Accordingly, Applicants respectfully request that the 35 U.S.C. § 103(a) rejections of claims 37-38 be withdrawn as well.

Examiner is invited to contact the undersigned to address any questions or concerns that might expedite the allowance of the present application. No fee is believed due in connection with this filing. However, in the event that there are any fees due, please charge the same, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

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/Brian A. Mair/
Brian A. Mair
Reg. No. 58,233
Attorney for Applicants

Slater & Matsil, L.L.P.
17950 Preston Rd., Suite 1000
Dallas, TX 75252
Tel: 972-732-1001
Fax: 972-732-9218